

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-21. (Cancelled)

22. (Currently Amended) The method according to claim 2064, wherein the solid-liquid separation is carried out by using a filtration apparatus.

23. (Currently Amended) The method according to claim 20-64 wherein the ~~acid/sugar~~ solution of acid and sugar recovered as the liquid phase through the solid-liquid separation is further subjected to a second solid-liquid separation so as to remove residual suspended solids (SS)-as-a-solid phase.

Claims 24-25. (Cancelled)

26. (Withdrawn) An apparatus for recovering an acid/sugar solution, comprising:

an aqueous dilution tank that receives water, and has means for putting a reaction mixture of a lignocellulosic material, a phenol derivative and an acid into the water;

a first solid-liquid separation apparatus that receives the diluted reaction mixture, and is adapted for and capable of carrying out solid-liquid separation so as to separate off a lignophenol derivative as a solid phase; and

a second solid-liquid apparatus for further carrying out solid-liquid separation treatment on a liquid phase recovered from the first solid-liquid separation apparatus so as to separate out residual suspended solid (SS) as a solid phase.

27. (Withdrawn) An apparatus for recovering an acid/sugar solution, comprising:

an aqueous dilution tank that receives water, and has means for putting a reaction mixture of a

lignocellulosic material, a phenol derivative and an acid into the water;

a first solid-liquid separation apparatus that receives the diluted reaction mixture, and is adapted for and capable of carrying out solid-liquid separation so as to separate off a lignophenol derivative as a solid phase; and

a standing tank for leaving a liquid phase recovered from the first solid-liquid separation apparatus that receives liquid from the standing tank, and is adapted for and capable of further carrying out solid-liquid separation treatment so as to separate out residual suspended solids (SS) as a solid phase.

28. (Withdrawn) An apparatus for recovering lignophenol derivatives and an acid/sugar solution, comprising:

an acid treatment/aqueous dilution tank that receives a phenol derivative-impregnated lignocellulosic material, and has means for adding an

acid to the lignocellulosic material, and means for putting diluting water into a reaction mixture containing the lignocellulosic material on which acid treatment has been carried out through the addition of the acid;

a first solid-liquid separation apparatus that receives the diluted reaction mixture, and is adapted for carrying out solid-liquid separation so as to separate off a lignophenol derivative as a solid phase;

a second solid-liquid separation apparatus adapted for further carrying out solid-liquid separation treatment on a liquid phase recovered from the first solid-liquid separation apparatus so as to separate out residual SS as a solid phase;

an agitating tank that receives the solid matter recovered through the first solid-liquid separation, and is adapted for adding water to the solid matter and agitating; and

a third solid-liquid separation apparatus that receives an aqueous slurry recovered from the

agitating tank, and is adapted for carrying out solid-liquid separation.

29. (Withdrawn) An apparatus for recovering lignophenol derivatives and an acid/sugar solution, comprising:

an acid treatment/aqueous dilution tank that receives a phenol derivative-impregnated lignocellulosic material, and has means for adding an acid to the lignocellulosic material, and means for putting diluting water into a reaction mixture containing the lignocellulosic material on which acid treatment has been carried out through the addition of the acid;

a first solid-liquid separation apparatus that receives the diluted reaction mixture, and adapted is for carrying out solid-liquid separation so as to separate off a lignophenol derivative as a solid phase;

a second solid-liquid separation apparatus for further carrying out solid-liquid separation

treatment on a liquid phase recovered from the first solid-liquid separation apparatus so as to separate out residual suspended solids (SS) as a solid phase;

a crushing apparatus that receives the solid matter recovered through the first solid-liquid separation, and is adapted for crushing the solid matter;

an agitating tank for adding water to the crushed solid matter; and

a third solid-liquid separation apparatus that receives an aqueous slurry recovered from the agitating tank, and is adapted for carrying out solid-liquid separation.

30. (withdrawn) An apparatus for recovering a lignophenol derivative and an acid/sugar solution, comprising:

an acid treatment tank that receives a phenol derivative-impregnated lignocellulosic material, and is adapted for adding an acid to bring about reaction;

an aqueous dilution tank that receives a reaction mixture of the lignocellulosic material, the phenol derivative and the acid recovered from the acid treatment tank, and has means for putting in diluting water;

a first solid-liquid separation apparatus that receives the diluted reaction mixture, and is adapted for carrying out solid-liquid separation so as to separate off a lignoohenol derivative as a solid phase;

a second solid-liquid separation apparatus for further carrying out solid-liquid separation treatment on a liquid phase recovered from the first solid-liquid separation apparatus so as to separate out residual suspended solids (SS) as a solid phase;

an agitation tank that receives the solid matter recovered through the first solid-liquid separation, and is adapted for adding water to the solid matter and agitating; and

a third solid-liquid separation apparatus that receives an aqueous slurry recovered from the

tank, and is adapted for carrying out solid-liquid separation.

31. (Withdrawn) An apparatus for recovering a lignophenol derivative and an acid/sugar solution, comprising:

an acid treatment tank that receives a phenol derivative-impregnated lignocellulosic material, and is adapted for adding an acid to bring about reaction;

an aqueous dilution tank that receives a reaction mixture of the lignocellulosic material, the phenol derivative and the acid recovered from the acid treatment tank, and has means for putting in diluting water;

a first solid-liquid separation apparatus that receives the diluted reaction mixture, and is adapted for carrying out solid-liquid separation so as to separate off a lignoohenol derivative as a solid phase;

a second solid-liquid separation apparatus for further carrying out solid-liquid separation treatment on a liquid phase recovered from the first solid-liquid separation apparatus so as to separate out residual suspended solids (SS) as a solid phase;

a crushing apparatus that receives the solid matter recovered through the first solid-liquid separation, and is adapted for crushing the solid matter;

an agitating tank for adding water to the crushing solid matter and agitating; and

a third solid-liquid separation apparatus that receives an aqueous slurry recovered from the agitating tank, and is adapted for carrying out solid-liquid separation.

32. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claims 28, further comprising an agitating tank that receives solid matter recovered from the third solid-liquid separation

apparatus, and is adapted for adding water to the solid matter and agitating; and a fourth solid-liquid separation apparatus that receives an aqueous slurry recovered from the agitating tank, and is adapted for carrying out solid-liquid separation.

33. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claims 29, further comprising an agitating tank that receives solid matter recovered from the third solid-liquid separation apparatus, and is adapted for adding water to the solid matter and agitating; and a fourth solid-liquid separation apparatus that receives an aqueous slurry recovered from the agitating tank, and is adapted for carrying out solid-liquid separation.

34. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claims 30, further comprising an agitating tank that receives solid matter recovered from the third solid-liquid separation

apparatus, and is for adding water to the solid matter and agitating; and a fourth solid-liquid separation apparatus that receives an aqueous slurry recovered from the agitating tank, and is for carrying out solid-liquid separation.

35. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claims 31, further comprising an agitating tank that receives solid matter recovered from the third solid-liquid separation apparatus, and is for adding water to the solid matter and agitating; and a fourth solid-liquid separation apparatus that receives an aqueous slurry recovered from the agitating tank, and is for carrying out solid-liquid separation.

36. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claims 28, further comprising: a crushing apparatus that receives solid matter recovered from a third solid-liquid separation

apparatus, and is for crushing the solid matter; an agitating tank for adding water to the crushing solid matter and agitating; and a fourth solid-liquid separation apparatus that receives an aqueous slurry recovered from the agitating tank, and is for carrying out solid-liquid separation.

37. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claims 29, further comprising: a crushing apparatus that receives solid matter recovered from a third solid-liquid separation apparatus, and is for crushing the solid matter; an agitating tank for adding water to the crushing solid matter and agitating; and a fourth solid-liquid separation apparatus that receives an aqueous slurry recovered from the agitating tank, and is for carrying out solid-liquid separation.

38. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claims 30, further comprising:

a crushing apparatus that receives solid matter recovered from a third solid-liquid separation apparatus, and is for crushing the solid matter; an agitating tank for adding water to the crushing solid matter and agitating; and a fourth solid-liquid separation apparatus that receives an aqueous slurry recovered from the agitating tank, and is for carrying out solid-liquid separation.

39. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claims 31, further comprising: a crushing apparatus that receives solid matter recovered from a third solid-liquid separation apparatus, and is for crushing the solid matter; an agitating tank for adding water to the crushing solid matter and agitating; and a fourth solid-liquid separation apparatus that receives an aqueous slurry recovered from the agitating tank, and is for carrying out solid-liquid separation.

40. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 36, wherein the first solid-liquid separation apparatus and the fourth solid-liquid separation apparatus are constituted from the same apparatus.

41. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 37, wherein the first solid-liquid separation apparatus and the fourth solid-liquid separation apparatus are constituted from the same apparatus.

42. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 38, wherein the first solid-liquid separation apparatus and the fourth solid-liquid separation apparatus are constituted from the same apparatus.

43. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar

solution according to claim 39, wherein the first solid-liquid separation apparatus and the fourth solid-liquid separation apparatus are constituted from the same apparatus.

44. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 36, wherein the third solid-liquid separation apparatus and the fourth solid-liquid apparatus are constituted from the same apparatus.

45. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 37, wherein the third solid-liquid separation apparatus and the fourth solid-liquid apparatus are constituted from the same apparatus.

46. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 38, wherein the third solid-liquid separation apparatus and the fourth

solid-liquid apparatus are constituted from the same apparatus.

47. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 39, wherein the third solid-liquid separation apparatus and the fourth solid-liquid apparatus are constituted from the same apparatus.

48. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 32, further comprising means for supplying a liquid phase recovered from the third solid-liquid separation apparatus into the acid treatment/aqueous dilution tank or the aqueous dilution tank as a diluting liquid.

49. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 33, further comprising means for supplying a liquid phase recovered from the third solid-liquid separation apparatus into the acid

treatment/aqueous dilution tank or the aqueous dilution tank as a diluting liquid.

50. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 34, further comprising means for supplying a liquid phase recovered from the third solid-liquid separation apparatus into the acid treatment/aqueous dilution tank or the aqueous dilution tank as a diluting liquid.

51. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 35, further comprising means for supplying a liquid phase recovered from the third solid-liquid separation apparatus into the acid treatment/aqueous dilution tank or the aqueous dilution tank as a diluting liquid.

52. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 36, further comprising means for supplying a liquid phase recovered from the

third solid-liquid separation apparatus into the acid treatment/aqueous dilution tank or the aqueous dilution tank as a diluting liquid.

53. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 37, further comprising means for supplying a liquid phase recovered from the third solid-liquid separation apparatus into the acid treatment/aqueous dilution tank or the aqueous dilution tank as a diluting liquid.

54. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 38, further comprising means for supplying a liquid phase recovered from the third solid-liquid separation apparatus into the acid treatment/aqueous dilution tank or the aqueous dilution tank as a diluting liquid.

55. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 39, further comprising

means for supplying a liquid phase recovered from the third solid-liquid separation apparatus into the acid treatment/aqueous dilution tank or the aqueous dilution tank as a diluting liquid.

56. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 32, further comprising means for supplying a liquid phase recovered from the fourth solid-liquid separation apparatus into the acid treatment/aqueous dilution tank or the aqueous dilution tank as a diluting liquid.

57. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 33, further comprising means for supplying a liquid phase recovered from the fourth solid-liquid separation apparatus into the acid treatment/aqueous dilution tank or the aqueous dilution tank as a diluting liquid.

58. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar

solution according to claim 34, further comprising means for supplying a liquid phase recovered from the fourth solid-liquid separation apparatus into the acid treatment/aqueous dilution tank or the aqueous dilution tank as a diluting liquid.

59. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 35, further comprising means for supplying a liquid phase recovered from the fourth solid-liquid separation apparatus into the acid treatment/aqueous dilution tank or the aqueous dilution tank as a diluting liquid.

60. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 36, further comprising means for supplying a liquid phase recovered from the fourth solid-liquid separation apparatus into the acid treatment/aqueous dilution tank or the aqueous dilution tank as a diluting liquid.

61. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 37, further comprising means for supplying a liquid phase recovered from the fourth solid-liquid separation apparatus into the acid treatment/aqueous dilution tank or the aqueous dilution tank as a diluting liquid.

62. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 38, further comprising means for supplying a liquid phase recovered from the fourth solid-liquid separation apparatus into the acid treatment/aqueous dilution tank or the aqueous dilution tank as a diluting liquid.

63. (Withdrawn) The apparatus for recovering a lignophenol derivative and an acid/sugar solution according to claim 39, further comprising means for supplying a liquid phase recovered from the fourth solid-liquid separation apparatus into the

acid treatment/aqueous dilution tank or the aqueous dilution tank as a diluting liquid.

64. (New) A method of preparing a solution of an acid and a sugar and a lignophenol derivative, comprising:

- (a) introducing a reaction mixture of a lignocellulosic material, a phenol derivative and an acid into water approximately the same volume of the mixture;
- (b) leaving the mixture to stand or maintaining the mixture in a weakly agitated state so as to agglomerate a lignophenol derivative produced as a solid phase; and
- (c) conducting a solid-liquid separation so as to separate the solid phase lignophenol derivative from a liquid-phase solution of acid and sugar.